UDC 547.118

USSR

GUDKOVA, I. P., CHAN DIN' DAT, and NIFANT'YEV, E. YE., Chair of Chemical Technology

"A Novel Method for the Conversion of Amidophosphites Into Amidophosphates"

Moscow, Vestnik Moskovskogo Universiteta, Vol 12, No 6, Nov-Dec 71, pp 750-751

Abstract: Amidophosphites were shown to react readily with carbon tetrachloride and methanol yielding corresponding amidophosphates. To 4 g of dimethylamido-1,3-butylenephosphite 6 ml methanol is added followed by dropwise addition of 4 ml carbon tetrachloride. The product is vacuum-distilled yielding 76.7% dimethylamido-1,3-butylenephosphate, b.p. 42-44°/1 mm Hg, n_D^{20} 1.4450, d^{20} 1.1120. Analogously the 6-tetraethyldiamidophosphate of 1,2;3,4-diisopropylidenegalactopyranose was obtained in 83% yield: b.p. 150-155°/10^{-4} mm Hg.

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USSR

UDC 547.427.3

NIFANT'YEV, E. YE., SHESTAKOVA, T. G., and KIRICHENKO, E. A.

"Triphenylphosphite Transesterification Reaction with Alcohols"

Leningrad, Zhurnal Obshchey Khimii, Vol 44, No 11, Nov 71, pp 2570-2571

Abstract: Highly purified triphenylphosphite reacts sluggishly in the transesterification reaction. The presence of catalytic amounts of metallic sodium shows no effect on the reaction. However, introduction of even trances of HCl accelerates the transesterification reaction considerably.

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USSR UDC 547.26'118

SHILOV, I. V., and NIFANT'YEV, E. YE., Moscow State University imeni M. V. Lomonosov

"Synthesis of Acid Amides of Phosphoric Acid"

Leningrad, Zhurnal Prikladnoy Khimii, Vol 44, No 11, Nov 71, pp 2581-2584

Abstract: Three methods for the synthesis of acid amides of phosphoric acid are reported. The goal was to get the products pure enough to omit final distillation. One route consisted of partial hydrolysis of intermediate amides of phosphoric acid:

$$(R_2N)_3P + H_2O \longrightarrow (R_2N)_2P(=O)OH + R_2NH.$$

The ease with which the reaction occurs depends on the radical: the hexabutyltriamide reacts at room temperature, the hexaethyl derivative needs a pH 3 medium, while the hexamethyltriamide has to be heated to 60-70°. Another method involved the reaction of complete amides of phosphoric acid with phosphoric acid; this reaction is exothermic, and the product obtained is sufficiently pure to be used without distillation. Hydrolysis of carbamoylphosphites was tried, but the product obtained was impure.

1/1

UDC 546.183

USSR

PETROVA, I. M., ZYK, N. V., NIFANT'YEV, E. YE.

"Hydrolysis and Acidolysis of Methriol Phosphite"

Vestnik Moskovskogo Universiteta, Khimiya, No 4, 1971, pp 433-435

Abstract: Earlier works have noted the great hydrolytic instability of methriol /1,1,1-tris(hydroxymethyl)ethane/ phosphite and concluded that it is hydrolyzed by even traces of moisture to the monocyclic acid phosphite. The authors established that the hydrolysis does not occur so simply. Studying the interaction of methriol phosphite with acids when heated to 80° for several hours, the authors determined that the reactivity of methriol phosphite is lower than that of non-cyclic normal phosphite. 2-Methyl-2-benzoyloxymethyl-1,3-propylene phosphite was produced by reesterifying methriol monobenzoate with dimethyl phosphite. Certain properties of this substance were studied, including reactions producing polyphosphites.

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USSR

UDC: 547.26'118.07

NIFANT'YEV, E. Ye., BLAGOVESHCHENSKIY, V. S., SOKURENKO, A. M., and SKLYARSKIY, L. S.

"Method for Obtaining Functional-Replacing Dialkyl Phosphates"

Moscow, Otkrytiya, izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, No. 33, 1971, p 77

Abstract: In this method, hypophosphorous acid is combined with alcohol, carbon tetrachloride, and a base of the type of triethylamine, under heating at from 100-125° C. The process is done in a medium of an inert organic solvent like dioxane. Patent claimed by the M. V. Lomonosov State University.

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USSR

UDC 547.26'118

NIFANT'YEV, E. YE., NASONOVSKIY, I. S., and BORISENKO, A. A., Moscow State University imeni M. V. Lomonosov

"Stereoisomerism of 1.2-Propylene Phosphite"

Leningrad, Zhurnal Obshchey Khimii, Vol 41, No 8, Aug 71, p 1876

Abstract: The authors found the phenomenon of stereoisomerism among acid five-membered alkylene phosphites. 1,2-Propylene phosphite, obtained in various ways, represents an approximately equal mixture of two stereoisomers alkylene phosphites, stereoisomeric five-membered phosphites possess very similar stability and do not interconvert under the action of acids, bases, or moderate heating. A study shows that stable 1,2-propylene phosphite is readily formed by hydrolysis of 1,2-propylene chlorophosphite with water.

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USSR UDC 547.341.07

NIFANT'YEV, E. YE., GALKINA, L. YE., RABOVSKAYA, N. S., Moscow State University imeni M. V. Lomonosov

"A Method of Synthesizing Trichlorovinylhexaalkyltriamidophosphonium Chlorides"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 23, 1971, Author's Certificate No 309934, Division C, filed 4 March 1970, published 26 Jul 71, p 74

Translation: This Author's Certificate introduces: 1. A method of making trichlorovinylhexaalkyltriamidophosphonium chlorides. As a distinguishing feature of the patent, an absolute amide of phosphorous acid is interacted with tetrachloroethylene in an organic solvent such as ether with subsequent isolation of the goal product by conventional methods. 2. A modification of this method distinguished by the fact that an equimolar ratio of reagents is used. 3. A modification of this method distinguished by the fact that the process is carried out in an inert gas atmosphere. 4. A modification of this method distinguished by the fact that the initial phosphorous acid amide is first purified of chlorohydrates of dialkyl amines.

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USSR UDC 547.241.07

NIFANT'YEV, E. YE., SHILOV, I. V., Moscow State University imeni M. V. Lomonosov

"A Method of Making Tetralkyl Diamides of α-Dialkylaminophosphonic Acid"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 17, 1971, Author's Certificate No 304257, Division C, filed 24 Dec 1969, published 25 May 1971, p 86

Translation: This Author's Certificate introduces: 1. A method of making tetralkyl diamides of α-dialkylaminophosphonic acid. As a distinguishing feature of the patent, phosphorous acid diamide is interacted with aminal in the presence of heat with subsequent isolation of the goal product by coventional methods. 2. A modification of this method distinguished by the fact that the process is carried out at a temperature of 130-150°C. 3. A modification of this method distinguished by the fact that the process is carried out in the presence of catalytic quantities of sodium.

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UDC 547.26'118

USSR

NIFANT'YEV, E. Ye., and SHILOV, I. V., Moscow State University imeni M. V. Lomonosov

"New Types of Reactions of Phosphorous Acid Hydrogen Amides"

Leningrad, Zhurnal Obshchey Khimii, Sep 70, Vol 41, No 9, pp 2104-2105

Abstract: It was found that acid amides undergo a characteristic and specific type of rearrangement in which they act as secondary amine donors. The reaction of phosphorous acid tetralkylamides with isocyanates yield corresponding ureas. The treatment of phosphorous acid tetramethyldiamide with phenyl isocyanate yields N-phenyl-N',N'-diethylurea in 60% yield. Ureas were similarly synthesized by the reaction of phosphorus acid tetramethyldiamide with methyl isocyanate, o- and m-chlorophenyl isocyanates and o-naphthyl isocyanate. The reaction is not common to other compounds. Thus, the reaction of phosphorous acid tetraethyldiamide with phenyl isocyanate and p-chlorophenyl isocyanate yields full amides of carbamoylphosphonic acids. Phenylcarbamoylphosphonic acid tetraethyldiamide was obtained in 33% yield. p-Chlorophenylcarbamyl-phosphonic acid tetraethyldiamide gave a 45% yield. The reaction of phosphorus acid diamides with ketones yields enamines.

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USSR UDC 547.26'118

NIFANT'YEV, E. Ye., BEBIKH, G. F., and SAKODYNSKAYA, T. P., Moscow State University imeni M. V. Lomonosov

"Use of Anilides of Alkylene- and Dialkylphosphorus Acids in the Todd-Atherton-Type Reaction"

Leningrad, Zhurnal Obshchey Khimii, Sep 71, Vol 41, No 9, pp 2011-2015

Abstract: Alkylenephosphorous acid anilides are made from alkylenechlorophosphites and aromatic amines. It is shown that anilidophosphites can be used to obtain iminoamidophosphates by oxidative phosphorylation and the Todd-Atherton-reaction. 1,3-Butylenephosphorous acid anilide readily reacts with carbon tetrachloride and diethylamine to form 1,3-butylene diethylaminophenyliminophosphate. The reaction is described in detail and the properties of alkylene(dialkyl)phosphorous acid anilides and arylimino-aklylene(dialkyl)phosphoric acid amides are given in tables.

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UDC 547.26'118

USSR

BORISENKO, A. A., and NIFANT'YEV, E. Ye., Moscow State University

"The Steric Effect in the Thermolysis of Alkyl 1,3-Alkylene Phosphites"

Leningrad, Zhurnal Obshchey Khimii, Vol XL, No 12, Dec 70, pp 2765-2766

Abstract: Among a series of neutral cyclic phosphites was observed the first example of a dependence of thermal stability of geometric isomers on stereochemistry. Specifically, two stereoisomeric esters of 1,3-butylene-phosphorous acid were found to differ in thermal stability, one remaining stable at 140°C, the other energetically eliminating isbutylene to form 1,3-butylene phosphite.

UDC 547.427.3:547.26'118:541.64

USSR

SHESTAKOVA, T. G., KIRICHENKO, E. A., and NIFANT'YEV, E. Ye.

"Phosphorus-Containing Polymers. XX. Synthesis of Neutral Polyphosphites Derived from Hexitols"

Leningrad, Zhurnal Prikladnoy Khimii, Vol 44, No 7, Jul 71, pp 1620-1624

Abstract: Sorbitol or mannitol reacted with triphenyl phosphite in molar ratios of 1:1, 1:2, and 1:3. The reaction took place at 130°. The hexitols also reacted in the same molar ratios with phosphorous acid hexaethyltriamide, which reacted more readily, the reaction taking place at 100-110°. The diethylamine formed could be removed from the reaction mixture more readily than phenol. The principal product (the only product of the reaction at molar ratios of 1:1 and 1:2) was hexitol polyphosphite. Upon reaction at a molar ratio of 1:3, low-molecular weight substances with the probable composition $C_6H_8O_6P_3(OPh)_3$ and $C_6H_8O_6P_3(NEt_2)_3$ were formed. Oxidation of the polyphosphites with NO_2 in dimethylformamide resulted in the formation of polyphosphates. On heating with S in dimethylformamide in an Ar stream, the polyphosphites were converted to polythiophosphates. Tests on the oxidation of oil AS-6 in the presence of the neutral hexitol phosphites (sorbitol triphosphite, mannitol triphosphite,

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SHESTAKOVA, T. G., et al., Zhurnal Prikladnoy Khimii, Vol 44, No 7, Jul 71, pp 1620-1624

1:1 sorbitol polyphosphite) showed that these substances were more effective antioxidants for transformer oil than acid hexitol phosphites.

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USSR

UDC 547.427.3:661.718.1

NIFANT'YEV, E. Ye., SHESTAKOVA, T. G., and KIRICHENKO, E. A.

"Phosphorus-Containing Polymers. XIX. Transesterification of Dimethyl Phosphite with Hexitols"

Leningrad, Zhurnal Prikladnoy Khimii, Vol 44, No 7, Jul 71, pp 1577-1582

Abstract: By heating sorbitol or mannitol with dimethyl phosphite at 145-150° in an Ar stream in the presence of metallic Na acting as a catalyst and distilling MeOH, hydrogen phosphites of the hexitols that contained 1, 2, or 3 cyclic phosphite groups were obtained, depending on the molar ratio of the reacting compounds. At the molar ratio 1:1, the reaction proceeded according to the equation $C_6H_8(OH)_6 + (MeO)_2P(=O)H \rightarrow C_6H_8(OH)_4\begin{smallmatrix}O\\O\end{smallmatrix}P(=O)H + 2\ MeOH$.

Prolonged heating of the hydrogen hexitol phosphites resulted in polymerization to acid polyphosphites, which apparently proceeded upon opening of the cyclic group. The acid phosphites and polyphosphites were oxidized with NO_2 to the corresponding acid phosphates. The phosphites were subjected to the Todd reaction (treatment with alkylamines and CCl_4), carried out in dimethylformamide.

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USSR

NIFANT'YEV, E. Ye., Zhurnal Prikladnoy Khimii, Vol 44, No 7, Jul 71, pp 1577-1582

Hydrogen sorbitol phosphite (1:1 ratio) was converted to sorbitol diethylamidophosphate by the reaction with diethylamine and CCl_4 and into neutral sorbitol phosphate by the reaction with triethylamine and CCl_4. Hydrogen sorbitol polyphosphite yielded sorbitol polyamidophosphate upon reaction with diethylamine and CCl_4 and sorbitol polyphosphate upon reaction with triethylamine and CCl_4. Tests with AS-6 oil showed that the cyclic hexitol phosphites would be effective antioxidants for transformer oil.

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USSR

UDC 547.438

NIFANT'EV, E. Ye.

Khimiya Fosfororganicheskikh Soyedineniy (The Chemistry of Organophosphorus Compounds), Moscow, 1971, pp 3-352

Translation:

Annotation: The chemistry of organophosphorus compounds comprises a broad and independent branch of organic chemistry, which has been growing vigorously for some time. In spite of the importance of this field, since 1940 not one monograph was published in the Russian language directed to general questions on the chemistry of such compounds. The present book fulfills this need. Nomenclature and classification of organophosphorus compounds are discussed, and their synthesis. Physical and chemical properties of basic groups are given. One chapter also contains a short summary of important inorganic derivatives used in organophosphorus synthesis. The author includes the most recent successes and general trends in the development of the chemistry of organophosphorus derivatives. The material published in the last years is given special attention.

The book is intended for students and degree candidates specializing in organophosphorus chemistry, and also technical personnel and instructors in higher schools.

USSR

NIFANT'EV, E. Ye., Khimiya Fosfororganicheskikh Soyedineniy, 1971, pp 3-352

Table of Contents

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USSR UDC 547.26.118

NIFANT'YEV, E. Ye., and FURSENKO, I. V., Chair of Chemical Technology

"Reactions of Acyl Phosphites with Secondary Amines and Mercaptans"

Moscow, Vestnik Moskovskogo Universiteta, Vol 12, No 2, Mar-Apr 71, p 245

Abstract: Acetyl 1,3-butylenephosphite was treated with equivalents of diethylamine in ether at -5° to yield the diethylamide of 1,3-butylenephosphorous acid, b. p. 87-88°/11 mm, n_D^{20} 1.4628. Without cooling, the reaction yields butylene phosphite and acetic acid diethylamide. Acyl phosphites do not react with mercaptans under conditions preventing the formation of free radicals. In presence of tertiary amines acyl phosphites are converted to thiophosphites when treated with mercaptans, or sodium mercaptides. In this fashion catechol-S-benzyl thiophosphate was obtained, b.p. 168-180/1mm, d_4^{20}= 1.2760, n_D^{20}= 1.6090.

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USSR

UDC 547.298.1.118.07

NIFANT'YEV, E. Ye., and SHILOV, I. V., Moscow State University imeni M. V. Lomonosov

"A Method of Making Acid Amides of Phosphorous Acid"

Moscow, Otkrytiya, izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, No 1, Jan 71, Author's Certificate No 289093, division C, filed 24 Dec 69, published 8 Dec 70, p 77

Translation: This Author's Certificate introduces a method of making acid amides of phosphorous acid by hydrolyzing phosphorous acid derivatives and isolating the goal product by conventional methods. As a distinguishing feature of the patent, the method is simplified by using diamidocarbamoyl phosphite as the phosphorous acid derivative.

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USSR UDC 547.241'183:542.951.9

NIFANT'YEV, E. YE., KODOLOV, V. I., and NONISHNEV, YE. P., Institute of Chemistry, Ural Branch of the Acad. Sc. USSR

"Reaction of Tetraethyldiamides of Alkylphosphorous Acids With Hydroquinone"

Leningrad, Zhurnal Obshchey Khimii, Vol 41 (103), No 2, Feb 71, p 482

Abstract: Depending on the ratios of the starting materials and on the reaction temperature, the distillate collected after completion of the reaction between tetraethylamide of ethylphosphorous acid and hydroquinone may contain diethylamine, triethylamine, ethanol, and amidophosphite.

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USSR UDC: 547.26'118:546.183.1

NIFANT'YEV, E. Ye., FURSENKO, I. V., Chair of Chemical Technology, Faculty of Chemistry, Moscow State University

"Acyl Phosphites"

Moscow, Uspekhi Khimii, Vol 39, No 12, Dec 70, pp 2187-2216

Abstract: The article is a survey of a new area in the field of organophosphorus compounds--the chemistry of acyl phosphites. The possible methods of synthesizing these compounds are discussed as well as their chemical properties. Probable reaction mechanisms are considered. Among the methods of synthesis which are discussed are interactions of phosphorous acid and dialkyl phosphites with carboxylic acid anhydrides, acid chlorides of trivalent phosphorus with carboxylic acids and their salts, pyrophosphites with carboxylic acids, acid amides of trivalent phosphorus with carboxylic acids and their anhydrides, and trialkyl acetyl silanes with phosphorous acid halides. Reactions with electrophilic and nucleophilic reagents are discussed.

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USSR

UDC 547.26'118

NIFANT'YEV, E. YE., and IVANOVA, N. L., Moscow State University imeni M. V. Lomonosov

"Haloalkylates of Phosphorous Acid Amides. Structure, Study of Alcoholysis"

Leningrad, Zhurnal Obshchey Khimii, Vol 40, No 7, Jul 70, pp 1492-1496

Abstract: The phosphonium salts obtained by alkylation of hexaalkyltriamides of phosphorous acid with methyl iodide do not undergo hydrolysis or alcoholysis. A study of the alkylation of the phosphorous acid amides with alkyl halides shows that the formation of ammonium salts in this reaction may take place as a result of secondary processes rather than direct N-alkylation.

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Organometallic Compounds

UDC 547.26'118

USSR

NIFANT'YEV, E. Ye., YELEPINA, L. T., and BALAKHONTSEVA, V. N., Moscow State University imeni M. V. Lomonsov

"Phosphorylation of Xylitol"

Leningrad, Zhurnal Obshchey Khimii, Vol 41 (103), No 3, Mar 71, pp 707-708

Abstract: Reaction of xylitol with phosphorous, hypophosphorous, and phosphonous acids is a complex reaction accompanied by dehydration of xylitol: xylitane is formed under all temperature conditions studied, at 80° a small yield of xylite phosphonites is obtained, and at higher temperatures high yields of xylitane phosphonites are obtained. Xylitane phosphonites disproportionate on storage giving xylitane diphosphonites and xylitane.

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UDC 547.26'118

USSR

NIFANT'YEV, E. Ye., BORISENKO, A. A., NASONOVSKIY, I. S., and MATROSOV, Ye. I.,
Moscow State University imeni M. V. Lomonsov

"Stereochemistry of 1,3-Butylenephosphites"

Moscow, Doklady Akademii Nauk SSSR, Vol 196, No 1, Jan-Feb 71, pp 121-123

Abstract: Stereochemical relationships between the isomers of 1,3-butylenephosphite were studied. One isomer -- the more stable -- was obtained by reacting 27.5 g dimethylphosphite, 22.5 g 1,3-butandiol and a small piece of sodium at 130°. When methanol stopped evolving, the product consisting of two isomers, was distilled at 110-130° in a 10^{-3} mm vacuum. After standing this material crystallized with a m.p. 52-52.5°. The labile isomer was obtained by reacting 16.4 g of the dimethylamide of 1,3-butylenephosphorous acid with acetic acid in absolute ether at 35°. Distillation of the material obtained gives a product with b.p. 97-97.5°/1 mm, n_D^{20} 1.4550, d_4^{20} 1.2600. The stable isomer is less soluble in organic solvents and has a lower R_F in thin layer chromatography on alumina. This more stable isomer is evidently associated to a larger extent than the labile material. Conversion of the

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NIFANT'YEV, E. Ye., et al, Doklady Akademii Nauk SSR, Vol 196, No 1, Jan-Feb 71, pp 121-123

labile isomer to the stable one is not a phenomenon of boat-chair interconversions; these isomers differ by the orientation of their substituents in relationship to the chair skeleton.

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USSR

UDC 547.26'118

NIFANT'EV, E. Ye., IVANOVA, N. L., GUDKOVA, I. P., SHILOV, I. V. Moscow State University imeni M. V. Lomonosov

"Acid Catalysis in the Reaction of Amides of Trivalent Phosphorus Acids with Mercaptans and Carbonyl Compounds"

Leningrad, Zhurnal Obshcei Khimii, Vol 40, No 6, Jun 70, pp 1420-1421

Abstract: Phosphorus acid amides (I) readily react with aliphatic mercaptans in the presence of acetic acid, yielding thiol esters. Carboxylation of I takes place only in the presence of acidic compounds. It is possible that this mechanism involves initial protonation of the P atom. Our previously proposed mechanism for the formation of α-aminophosphonates involving only the amidophosphite and an aldehyde does not agree with the experimental data. It is probable that also in this case, the mechanism is based on a preliminary protonation step.

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USSR

UDC 547.26'118

NIFANT'EV, E. E., NASONOVSKII, I. S., BORISENKO, A. A. Moscow State University imeni M. V. Lomonosov

"Stereoisomerism of Cyclic Acid Phosphites"

Leningrad, Zhurnal Obshchei Khimii, Vol 40, No 6, Jun 70, pp 1248-1251

Abstract: Pare crystalline 1,3-propylene phosphite is transformed into two phosphites with different NMR spectra, when heated to 140°. This phenomenon cannot be explained by destructional or skeletal isomerization of the original compound since after distillation of the mixture, 1,3-propylene phosphite is uncovered in high yield. Likewise, no boat-chair conformational change can be assumed, since the emergence of the two different forms is not observed in solution of the phosphite in organic solvents or on mild warming. Consequently, the formation of the two phosphites can be attributed only to a conformational change at the phosphorus atom. A similar transformation was observed also with 1,3-butylene phosphite. A tertiary amine addition facilitated the transformation in this case, which is an indication of the prototropic character of the transformation.

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USSR

UDC 538.27:547.26'118

NIFANT'EV, E. E., IVANOVA, N. L., BORISENKO, A. A. Moscow State University imeni M. V. Lomonosov

"Application of NMR Spectroscopy to the Study of Alcoholysis of the Amides of Trivalent Phosphorus Acids"

Leningrad, Zhurnal Obschei Khimii, Vol 40, No 6, Jun 70, pp 1420

Abstract: NMR spectroscopy was applied to the P^{31} nucleus in a study of the alcoholysis of phosphoamides. It was established that triamides of phosphorous acid are more readily alcoholyzed than the amidoesters. The catalytic effect of amine hydrochlorides on the rate of substitution reactions could be confirmed by NMR. In the case of the alcoholysis of the dimethylamide of 1,3-butylenephosphorous acid, stereospeciticity of the substitution reaction the ring phosphorus atom was observed.

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1/2 015 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--REACTION OF 1,6,ANHYDROHEXOSES WITH HYPOPHOSPHOROUS ACID -U-

AUTHOR-(03)-NIFANTYEV, E.YE., GUDKOVA, I.P., KOCHETKOV, N.K.

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CIRC ACCESSION NO--AP0116883

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. HEATING 10 G H SUB3 PO SUB2 WITH 10 G LEVOGLUCOSAN 10 HR AT 80-5DEGREES GAVE A VERY HYGROSCOPIC SOLID CONTG. 7.3PERCENT P, WHICH WAS SEPD. INTO (6,DEOXY,D,GLUCOS,6,YL)PHOSPHONOUS ACID, (I), ISOLATED AS NH SUB4 SALT, M. 180DEGREES. THE CRUDE PRODUCT, REPPTD. SEVERAL TIMES FROM ME SUB2 NCHO WITH ET SUB2 O GAVE A PRODUCT CONTG. 6.8-7.2PERCENT P, WHICH HEATED WITH N HCL 1.5 HR GAVE CHROMATOGRAPHIC SPOTS OF D,GLUCOSE AND I. HEATING LEVOGLUCOSAN WITH H SUB3 PO SUB2 AND NAPH SUB2 O SUB2 40 HR AT 85DEGREES GAVE NA SALT WITH PROBABLE STRUCTURE (II) PURIFIED BY PPTN. FROM MEOH WITH ET SUB2 O, IN AQ. SOLN. THIS UNDERGOES MUTAROTATION. SIMILAR REACTION WITH 1,6,ANHYDROGALACTOSE IN 15 HR GAVE THE NA SALT OF (6,DEOXY,D,GALACTOS,6,YL)PHOSPHONOUS ACID, PURIFIED BEST ON A CELLULOSE COLUMN. 1,2:3,4,DI,O,ISOPROPYLIDENE,ALPHA,L,ARABINO,HEX,5,ENOPYRANOSE AND NAH SUB2 PO SUB2 IN MEOH WITH A TRACE OF TERT,BUOOH IN 15 HR AT 145DEGREES IN AN AUTOCLAVE, THEN HEATED WITH AQ. HCL 1 HR, GAVE THE NA SALT OF (6,DEOXY,D,GALACTOS,6,YL)PHOSPHONOUS ACID. I CHLORINATED IN AQ. SOLN. IN THE COLD AND KEPT 1.5 HR PRIOR TO NEUTRALIZATION TO PH 7.5, GAVE 60PERCENT NH SUB4 SALT OF (6,DEOXY,D,GLUCOS,6,YL)PHOSPHONIC ACID, AMORPHOUS SOLID, WHICH WAS OXIDIZED WITH 4 MOLES PERIODATE (KIO SUB4), WHILE HEATING THE ACID WITH MEOH AT 140DEGREES AND GAVE 6,DEOXY,D,GLUCOSE AND ME PHOSPHITES.

FACILITY: MOSK. GOS. UNIV. IM. LOMONOSOVA, MOSCOW, USSR.

UNCLASSIFIED

USSR

UDC 632.95

KIRANT'YEV, E. YE., SHESTAKOVA, T. G., and KIRICHENKO, E. A.

"Method of Synthesizing Hexitolcyclophosphonates"

USSR Author's Certificate No 248676, filed 27 May 68, published 7 Jan 70 (from RZh-Khimiya, No 13, (II), 10 Jul 70, Abstract No 13N707)

Translation: Hexitolcyclophosphonates of the general formula $CH_2(OH)CH(OH)CH(OH)(O)CH(OH)CH_2OP(O)R$ (I) (R = alkyl, cycloalkyl) are obtained by the interaction of hexitolphosphonites with tertiary amines and CCl_4 in a dioxane medium at 80° with the subsequent recovery of I by known methods. Mannitol and sorbitol are used ad hexitols. A mixture of 6.24 g sorbitol (mannitol) cyclohexylphosphonite in dioxane, 2.2 g Et_3N and 3.1 g CCl_4 is kept at 80° for 4-5 hr, Et_3N. HCl is filtered off, the dioxane is evaporated at 70°/10-20 mm, and 6.1 g I (R = cyclohexyl) are obtained, quantitative yield. I (R = iso-Bu) is obtained analogously. I can be used as physiologically active substances. A. F. Prokof'yeva

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USSR

UDC: 547.118

NIFANT'YEV, E. YE., GUDKOVA, I. P., and KOCHETKOV, N. K., Moscow State University imeni M. V. Lomonosov, Moscow, Ministry of Higher and Secondary Specialized Education RSFSR, and Institute of Organic Chemistry imeni N. D. Zelinskiy, Moscow, Academy of Sciences USSR

"Study of Reaction of 1,6-Anhydrohexoses With Hypophosphorous Acid"

Leningrad, Zhurnal Obshchey Khimii, Vol 40, No 2, Feb 70, pp 460-463

Abstract: In the search for methods for the synthesis of phosphorus-containing sugars, the authors attempted to use the reaction of 1,6-anhydrohexoses with hypophosphorous acid by analogy with the reaction of hypophosphorous acid with acetals. Experiments showed that heating of levoglucosan with hypophosphorous acid or with a mixture of the acid with its sodium salt at 80-85° gives 6-desoxy-6-glycophosphonous acids.

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USSR

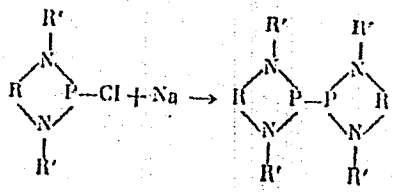
UDC 547.26'118

KOMLEV, I. V., ZAVALISHINA, A. I., CHERNIKEVICH, I. P., PREDVODITELEV, D. A., and NIFANT'YEV, E. YE., Moscow State University imeni M. V. Lomonosov

"Amides of Hypodiphosphorous Acid"

Leningrad, Zhurnal Obshchey Khimii, Vol 42(104), Vyp 4, 1972, pp 802-807

Abstract: Metallic sodium was reacted with cyclic amidoacyl chlorides to form the amides and esteramides of the hypodiphosphorous acid as given in the following formula:



The anhydride reactant can be prepared by treating alkylenediamines with PCl_3 in the presence of triethylamine. The structure was confirmed by the NMR spectra of P^{31} and the IR spectra, especially the intense absorption in the region corresponding to the energy of the N-P vibration. The P-P bond is

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USSR

KASATKINA, I. L., and NIFANT'YEVA, A. K., Institute of Regional Pathology, Ministry of Health, Kazakh SSR

"Comparative Study of Primary and Secondary Chronic Brucellosis"

Alma-Ata, Zdravookhraneniye Kazakhstana, No 4, 1971, pp 29-31

Abstract: Analysis of the case histories of 1,139 persons hospitalized from 1961 to 1967 with chronic brucellosis, 855 with the primary form and 284 with the secondary form, failed to disclose any significant qualitative differences between the two forms in symptoms, clinical course, or results of therapy. Some of the symptoms (e.g., temperature, spleen and liver enlargement, allergic neurologic, and hematologic disorders) were slightly more pronounced in the secondary form, but the course of the disease was not necessarily milder. The effects of therapy were somewhat better in patients with the primary form of chronic brucellosis: Clinical recovery or marked improvement occurred in 59% of the cases compared with 45% of the cases of secondary chronic brucellosis. It is noted that the primary chronic form may have a more unfavorable course because of diagnostic difficulties and consequent lateness in initiating therapy.

1/1

UDC 621.382.002

USSR

REVELEVA, M. A., MARTYNOVA, N. A., NIFONTOV, N. G.

"Effect of Some Nonorganic Protective Coatings on the Surface Properties of Silicon"

V sb. Vopr. mikroelektroniki (Problems of Microelectronics -- Collection of Works), Kiev, "Nauk. dumka," 1971, pp 103-110 (from RZh--Elektronika i yeye primeneniye, No 10, October 1971, Abstract No 10B490)

Translation: Films of SiO_2, which are not inferior in their characteristics to the thermally grown, are produced by the reactive sputtering method. The effect of reactive sputtering of films on the surface properties of Si is studied. At the SiO_2--Si boundary an accumulation of holes is discovered in the space-charge layer of both n- and p-Si. It is assumed that in contrast to thermal SiO_2, the reactive SiO_2 contains a negative charge. The density of this charge is equal to $(2-5) \cdot 10^{11}$ cm^{-2}. Drift of the charge is not discovered. The small changes of the characteristics with prebreakdown fields are explained by polarization of the dielectric. A test of the passivating properties of the films obtained showed their reliability for protection and creation of non-housed semiconductors. 3 ill. 5 ref. I.M.

1/1

UDC 621.317.725

USSR

KARLINER, M. M., NIFONTOV, V. I., ORESHKOV, A. D., Novosibirsk

"Precision Digital-to-Analog Converter"

Novosibirsk, Avtometriya, No 2, 1972, pp 88-92

Abstract: The control system for the VEPP-3 storage element using the computer described previously [M. M. Karliner, et al., Avtometriya, No 2, 1972] requires digital-to-analog converters of the potentiometric type which satisfy the following requirements: one digital-to-analog converter must insure a relative error of the division factor of less than $\pm 1 \cdot 10^{-4}$ with a factor varying from 0.1 to 1; the remaining digital-to-analog converters must insure an error of the division factor of less than $\pm 3 \cdot 10^{-4}$ for the input voltage varying from 0.5 to 5 volts. The converters must have galvanic decoupling of the analog part from the control circuits. The circuitry of the digital-to-analog converters, the procedure used in selecting their elements and checking them are described. The converters are executed on the basis of the ohmic decoding grid R-2R [P. Campiche, Etude d'un convertisseur numerique analogique. JSR-PO/70-22, Geneva, 1970] and two-position transistor switches. The digital-to-analog converter is selected by means of an address decoder circuit. The characteristics of the 1KT011A and 1KT621 integral breakers used as the switching elements are presented. The results of checking a 16-bit digital-to-analog

USSR

KARLINER, M. M., et al, Avtometriya, No 2, 1972, pp 88-92

converter are tabulated in the form of the voltage at the output from the converter at the "elongated transition" points. The developed converters have the following parameters: input and output voltage range +6.3 volts for the converter with 1KT011A switches, ±30 volts for the converter with 1KT621 switches, the number of bits for the converter with 1KT011A switches is 12, and for the converter with the 1KT621 switches, 16, the division factor error for the converters of the first type is $\pm 10^{-4}$ (for input voltages from 0.5 to 5 volts) and for converters of the second type it is $\pm 1 \cdot 10^{-5}$; the temperature drift of the division factor in the temperature range from 20 to 60° C for the converter of the first type is less than $\pm 3 \cdot 10^{-6}$/degree and for the converter of the second type it is on the order of $+2 \cdot 10^{-1}$/degree; the zero temperature drift is $\leq$ 5 microvolts/degree, the buildup time constant of the output voltage at the converter output is on the order of 2 microseconds; the output impedance of the converter is 10 kilohms; the digital part of the converter is made from integrated circuits series 217. The converter is executed on one printed textolite plate.

Radar

SO: JPRS 56143
1 June 72

UDC 629.7.058.74.001

"Measuring the Angular Position of a Target by Scanning Radar against a Background of Correlated Noise," Yu. A. Nifontov, V. A. Likharev, Teoriya i Tekhnika Radiolokatsii, III, Trudy MAI (Radar Theory and Practice, III, Works of the Moscow Order of Lenin Aviation Institute imeni Sergo Ordzhonikidze), No 207, Mashinostroyeniye Press, 1970, pages 16–23

The problems of estimating the target azimuth against a background of correlated noise are solved. The potential accuracy of angle gating is determined. A study is made of a quasioptimal algorithm for measuring the angular position of the target. The bibliography has 6 entries.

UDC 629.7.058.54.001

"Estimating the Direction-Finding Accuracy of a Scanning Radar Using the Markov Chain Apparatus," V. A. Likharev, Y. A. Furman, A. S. Kartashkin, Teoriya i Tekhnika Radiolokatsii, III, Trudy MAI (Radar Theory and Practice, III, Works of the Moscow Order of Lenin Aviation Institute imeni Sergo Ordzhonikidze), No 207, Mashinostroyeniye Press, 1970, pages 24–29

A method of calculating the estimate dispersion of the azimuth measured by a scanning radar is discussed. The azimuth is estimated by the maximum output voltage of the binary integrator using the "m out of n" criterion. In order to estimate the accuracy of direction-finding, the apparatus of discrete Markov chains is used. It is demonstrated that the transition probability matrix for the Markov chain in the given case will be a Jacobian matrix. Expressions are derived for calculating the matrix elements. The accuracy characteristic of the direction finding is calculated for a number of pulses in the packet n = 5 as an example. There is 1 illustration and a 7-entry bibliography.

SO: JPRS 56143
01 June 1972

NIFONTOV, YU.A.

NIFONTOV, YU. A.

Radar

GLORIA

SO: JPRS 56143
1 June 72

UDC 629.7.058.74.001

MEASURING THE ANGULAR POSITION OF A TARGET BY SCANNING RADAR AGAINST A BACKGROUND OF CORRELATED NOISE

Yu. A. Nifontov, Candidate of Technical Sciences
[illegible], Candidate of Technical Sciences

Pages 16-22

The problems of measuring the angular position of a target by scanning radar were the subject of references [1,2]. However, this research dealt only with the problems of measuring angles against a background of natural receiver noise. The presence of correlated noise leads to a statistical dependence of the output voltages of the radar receiver corresponding to one range. Therefore, under the effect of correlated noise on the radar, the echo packet must be processed considering the statistical relations between the pulses at the quantizer output.

The following problems are being solved at the present time:

a) Finding the estimate of the angular position of the target in the presence of binary quantization against a background of correlated noise,

b) Determination of the potential accuracy of measuring angles,

c) Study of the quasioptimal algorithm for measuring the angular position of the target.

Estimating the Angular Position of a Target by the Maximum Plausibility Method

In finding the algorithm for optimal estimation of the angular position of a target with binary quantization according to the maximum plausibility criterion, it is necessary to have a multidimensional distribution law of the signal-plus-noise realizations at the quantizer output. In the general case, it is highly complicated to find the multidimensional distribution for binary random variables. However, the majority of real signals and noise can be represented as a Markov process or as a component of a Markov process. This is obvious from reference [6]. For example, the reflections from passive [illegible] have a multidimensional normal distribution. If the correlation function of the process is in the form of an exponential curve, this process is gaussian Markov. We shall consider that the set of pulses of the output voltage of the quantizer corresponding to one range forms a simple Markov chain. The plausibility function of the given discrete sequence is written in the form

USSR UDC 621.396.932.1

NIFONTOV, Yu. A., LIKHAREV, V. A.

"Measuring the Angular Position of a Search Radar Target Against a Background of Correlation Interference"

Tr. Mosk. aviats. in-ta (Works of Moscow Aviation Institute), 1971, vyp. 207, pp 15-22 (from RZh-Radiotekhnika, No 12, Dec 71, Abstract No 12G78)

Translation: Solutions are found for problems of evaluating the azimuth of a target against a background of correlation interference. Potential accuracy is determined. A quasioptimum algorithm for measuring the angular position of the target is studied. Bibliography of six titles. Resumé.

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USSR

UDC 577.4

NIGGOL', V. K.

"Basic Forest Use Model"

V sb. Primeneniye mat. v ekon. (Application of Mathematics in Economics -- collection of works), Vyp. 7, Leningrad, Leningrad University, 1972, pp 115-119 (from RZh-Kibernetika, No 7, Jul 72, Abstract No 7V550)

No abstract

1/1

USSR

UDC: 51

KARPOV, E. A., SUROVTSOV, L. K., NIGGOL', V. K.

"Concerning a Problem in the Dynamics of Forest Resources"

V sb. Primeneniye mat. v ekon. (Use of Mathematics in Economics--collection of works), vyp. 7, Leningrad, Leningrad University, 1972, pp 131-135 (from RZh-Kibernetika, No 6, Jun 72, Abstract No 6V484)

Translation: The paper presents a mathematical formulation of the problem of determining the extent of forest utilization for a planned period assuming a certain condition of dimensionality of utilization. The problem is treated from the standpoint of the mathematical theory of optimum processes. [From the introduction].

1/1

USSR

UDC: 621.384.6.5

ARZUMANOV, A. A., NEMENOV, L. M., ANISIMOV, O. K., BATALIN, S. S., VOLKOV, B. A., GROMOV, D. D., KRAVCHENKO, Ye. T., KRUGLOV, V. G., NIGMATOV, M. Kh., POPOV, Yu. S., PROKOV'YEV, S. I., and RYBIN, S. N.

"Isochronic Cyclotron With Controllable Ion Energy"

Alma-Ata, Izvestiya AN KazSSR--Teriya Fiziko-matematicheskaya, No 4, 1973, pp 6-15

Abstract: A discussion of the isochronic cyclotron with controllable ion energy built around the U-150-2 accelerator installed in the Institute for Nuclear Physics of the Kazakh SSR Academy of Sciences in 1965 is given. Calculations of the fundamental parameters made with an electronic computer are presented, together with the results of a theoretical analysis, a large part of which was based on approximation methods. These results were verified by a numerical method. The description is given of a program developed for investigating and modeling the magnetic field on a mock-up with a scale of 1:3. An outline drawing of the magnetic arrangement is given, along with curves of the magnetic field. The current correction for the magnetic field is explained, with an illustrative photograph of the correction winding. Also discussed are the

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(8)

USSR

UDC: 631.384.6.5

ARZUMANOV, A. A., et al, Izvestiya AN KazSSR--Teriya Fiziko-matematicheskaya, No 4, 1973, pp 6-15

high-frequency system and the slit-type ion source, the ions entering the accelerator chamber radially. Curves for the change in beam intensity for accelerated alpha particles are plotted as a function of the accelerator radius. A photograph of the area of installation, showing a beam of protons in air with an energy of 30 Mev, is reproduced together with a photograph of the equipment itself.

2/2

USSR

Biochemistry

UDC 591.105:547.993:598.126

USSR

NIGMATOV, Z. and SOROKIN, V. M., Institute of Biochemistry, Academy of Sciences, Uzbek SSR

"Isolation of Cholinesterase From Central Asian Cobra Venom"

Tashkent, Uzbekskiy Biologicheskiy Zhurnal, No 6, 1972, pp 15-17

Abstract: Venom from the Central Asian cobra (Naja oxiana Eichwald) was separated by ion-exchange chromatography into 10 fractions, with cholinesterase activity detected only in fraction VI. After gel filtration on Sephadex G-25, this fraction separated into two components, VI-C-I and VI-C-II. Cholinesterase was found in VI-C-I where its activity was 46 times higher than the specific activity in the whole venom. The yield of the enzyme was 51%. The high degree of uniformity of the preparation was demonstrated by rechromatography and starch and polyacrylamide gel electrophoresis.

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USSR UDC 591.105:577.15.598. 126

SOROKIN, V. M., NIGMATOV, Z., and YUKEL'SON, L.YA., Institute of Biochemistry, Acad. Sc. UzSSR

"Characterization of the Cholinesterase of Middle Asian Cobra Venom"

Tashkent, Khimiya Prirodnykh Soyedineniy, No 6, 1972, pp 783-789

Abstract: Electrophoretically homogeneous preparation of cholinesterase has been obtained by chromatographing the venom of Naja oxiana Eichwald on a sulfoethylsephadex C-50 column. The activity of the isolated cholinesterase depends on the concentration of the enzyme, on time and on the temperature of incubation as well as on the pH. Optimal conditions are: incubation time of the enzyme with the substrate -- 20-30 min; pH -- 8.0-8.5; temperature -- 37-38°. Already at the concentration of 2 μmoles diisopropyl fluorophosphate suppresses completely the activity of cobra venom cholinesterase. The venom cholinesterase hydrolyzes acetylcholine chloride and acetylthiocholine bromide, but exhibits no effect on butyrylthiocholine bromide, in analogy to true cholinesterases. Cobra venom preparations of the cholinesterase have no lethal activity and do not amplify the activity of this venom's neurotoxins. This cholinesterase is thermally stable.

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UDC 577.11

USSR

SOROKIN, V. M., NIGMATOV, Z., and YUKEL'SON, L. Ya., Institute of Biochemistry, Academy of Sciences Uzbek SSR, Tashkent

"Fractionation of Central Asian Cobra Venom on Ethylsulfonic Sephadex and the Biological Activity of the Resulting Fractions"

Moscow, Biokhimiya, No 1, 1972, pp 112-116

Abstract: Central Asian cobra (Naja oxiana Eichwald) venom was separated into 10 fractions when applied to ethylsulfonic Sephadex C-50. Fractions 4, 7, 8, and 9 proved to be toxic. Phospholipase A, cholinesterase, hyaluronidase, ATP-pyrophosphatase, and 5-nucleotidase activities were detected in one or two fractions each. The yields were highest for hyaluronidase (67 percent), cholinesterase (52 percent), and 5-nucleotidase (47 percent). Hyaluronidase and cholinesterase were found to be highly homogeneous.

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USSR

UDC 591.105:577.15:598.126

NIGMATOV, Z. N., SOROKIN, V. M., and YUKEL'SON, L. YA., Institute of Biochemistry, Academy of Sciences UzSSR

"Phosphodiesterase of the Central Asian Cobra Venom"

Tashkent, Khimiya Prirodnykh Soyedinenii, No 5, 1972, p 688

Abstract: The venom was chromatographed on C-50 sulfoethyl sephadex column, ten fractions being collected. Fractions 7 and 8 showed the 5'-nucleotidase activity; the ATP-pyriphosphatase activity was distributed between fractions 6 and 7, and phosphodiesterase was found only in fraction 6, coming out concurrently with cholinesterase. Fraction 6 was passed through G-25 sephadex column, separating the phosphodiesterase from cholinesterase.

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USSR UDC 621.165:533.6.011.001.5

NIGMATULIN, B. I.

"Hydrodynamic Stream Model of a Two-Phase Flow in an Annular Dispersion Process"

Tr. Mosk. Vyssh. Tekhn. Uch-shcha im. N. Ye. Baumana /Works of the Moscow Higher Technical School imeni N. Ye. Bauman/, No 144, 1971, pp 56—63 (from Referativnyy Zhurnal, Turbostroyeniye, No 49. Single Issue No 4, Apr 72, Abstract No 4.49.26)

Translation: The hydrodynamics in cylindrical channels of two-phase annular dispersion flows are analyzed, the flows being characterized by a joint motion of the liquid boundary layer and the flow kernel, in one's turn representing a mixture of gas, vapor, and liquid drops. The phase transformations and the irregularity of mass velocities in the kernel and the layer were taken into account. The derived equations were used for the determination of pressure losses by streaming of such mixture of liquid distribution between the layer and the kernel of the flow, and also for the slip determination between phases and the length of the stabilization section. Four illustr., seven biblio. refs. 1/1

1/2 038 UNCLASSIFIED PROCESSING DATE--27NOV70

TITLE--SHOCK WAVE EFFECTS IN TWO PHASE SOLIDS DURING PHASE TRANSFORMATIONS -U-

AUTHOR--NIGMATULIN, R.I.

COUNTRY OF INFO--USSR

SOURCE--ZHUR. PRIKLAD. MEKHAN. I TEKHN. FIZIKI, JAN.-FEB. 1970, (1) 88-95

DATE PUBLISHED--------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--SHOCK WAVE, WAVE PROPAGATION, IRON

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--2000/1334 STEP NO--UR/0207/70/000/001/0088/0095

CIRC ACCESSION NO--AP0124984

UNCLASSIFIED

2/2 038 UNCLASSIFIED PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0124984

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A THEORETICAL TREATMENT OF THE MOTION OF A TWO PHASE SOLID IN WHICH EACH PHASE OCCUPIES A SPECIFIC PROPORTION OF THE VOLUME IS PRESENTED WITH SPECIAL REF. TO THE PROPAGATION OF SHOCK WAVES IN SUCH A MEDIUM. AS A PARTICULAR EXAMPLE OF THE THEORY, THE BEHAVIOUR OF AN FE MISSILE STRIKING AN FE TARGET IS CONSIDERED. AS A RESULT OF THE IMPACT GAMMA IN EQUILIBRIUM EPSILON PHASE T4ANSFORMATIONS TAKE PLACE IN THE FE AND MODIFY THE PROPAGATION AND DAMPING OF THE CORRESPONDING SHOCK WAVE.

UNCLASSIFIED

USSR

UDC 536.46:533.6

NIGMATULIN, R. I., VAYNSHTEYN, P. B.

"Flame Propagation in a Mixture of Gas and Particles"

V sb. Goreniye i vzryv (Combustion and Explosion -- Collection of Works), Moscow, "Nauka", 1972, pp 182-185 (from RZh-Mekhanika, No 3, Mar 73, Abstract No 3B966)

Translation: The particular features of the formulation of the problem on the steady-state propagation of a flame front in gaseous suspensions are discussed. In particular, the character of particular points corresponding to equilibrium conditions is investigated for the case of a purely heterogeneous combustion regime of the particles. It is shown that the asymptotic behavior of the particle parameters behind the flame front is a function of the composition of the fresh mixture. Authors' abstract.

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USSR

UDC 621.35.035

NIGMATULLIN, R. SH., FISH, V. M., GORDEYEVA, A. P.

"Calculation of the Electrochemical Concentration Converters of Nonelectric Variables"

Tr. Kazan. aviats. in-ta (Works of Kazan' Aviation Institute), 1971, vyp. 137, pp 70-73 (from RZh-Khimiya, No 12, Jun 72, Abstract No 12L338)

Translation: Relations are presented for calculating the characteristics of the cathode region of an electrochemical sensor of nonelectric variables. The relations were obtained for various configurations of the channel considering the sign-sensitive design of the device.

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1/2 022 UNCLASSIFIED PROCESSING DATE--27NOV70

TITLE--ELECTROCHEMICAL FLOW RATE SENSOR FOR A CONDUCTING LIQUID -U-

AUTHOR-(02)-NIGMATULLIN, R.SH., GABSALYAMOV, G.G.

COUNTRY OF INFO--USSR

SOURCE--PRIB. SIST. UPR. 1970, (3), 27-9

DATE PUBLISHED-------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--FLOW RATE, PLATINUM ELECTRODE, ELECTROCHEMISTRY, FERRICYANIDE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3006/0912 STEP NO--UR/0445/70/000/003/0027/0029

CIRC ACCESSION NO--AP0134641

UNCLASSIFIED

UNCLASSIFIED PROCESSING DATE--27NOV70

2/2 022

CIRC ACCESSION NO--AP0134641

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A SENSOR WAS DESIGNED FOR LOW FLOW RATES OF CONDUCTING LIQS. IT IS BASED ON THE DEPENDENCE OF THE DIFFUSION CURRENT OF THE DEPOLARIZER ON THE RATE OF FLOW OF THE LIQ. TO THE ELECTRODE, AS DESCRIBED BY THE LEVICH EQUATION. THE APP. CONSISTS OF 2 SMOOTH PT ELECTRODES AND A CIRCUIT COMPRISING A SOURCE OF CURRENT AND THE USUAL MEASURING UNITS. IN SOLNS. CONTG. (FE(CN) SUB6) SUB4 PRIME NEGATIVE, THE SENSOR CHARACTERISTICS WERE DETD. IN THE REGION 0-1.5 M-SEC AND COMPARED TO THEORY. GOOD AGREEMENT WAS OBTAINED.

UNCLASSIFIED

USSR UDC 681.2.087.92

NIGMATULLIN, R. SH., and NASYROV, I. K.

"On the Theory of Two-Terminal Integrating Network"

Tr. Kazan. aviats. in-ta (Works of the Kazan' Aviation Institute), 1971, vyp 137, pp 65-69 (from RZh-Avtomatika, Telemekhanika i Vychislitel'naya Tekhnika, No 7, Jul 72, Abstract No 7A96)

Translation: A theoretical investigation is made of a chemotronic two-terminal integrating network with a three-ion electrolyte. The effect which the volumetric resistance and the geometry of the diffusion barrier have on the integration characteristics is considered. It is shown that the dynamic integration range has a lower bound due to the fact that relaxation processes in the diffusion barrier take place more slowly than in the integral section. One illustration, bibliography of four titles.

1/1

USSR

UDC: 621.385.633.1.001.5

YUR'YEV, V. I., DOBRYNCHENKO, V. N., SHESTIPEROV, V. A., NIGMATULLIN, U. A.

"Experimental Study of the Interaction Between Synchronous Waves of an Electron Stream and the Traveling Wave of an Electrodynamic Structure"

Moscow, Radiotekhnika i Elektronika, Vol 17, No 4, Apr 72, pp 830-834

Abstract: The paper presents the results of an experimental study of O-type interaction between the synchronous waves of an electron stream and the field of a special electrodynamic structure. An actual gain of 13 dB is attained as well as an electron amplification factor of more than 20 dB. Quantitative agreement is established between the experimental and theoretical curves for linear gain as a function of beam current and magnetic field strength.

USSR

UDC 539.3:534.1

METSAVEER, Ya. A. and NIGUL, U. K.

"Determination of the Thickness and Radius of a Spherical Shell on the Basis of Echo Signals"

Moscow, Mekhanika Tverdogo Tela, No 6, Nov-Dec 72, pp 60-66

Abstract: The discussion concerns echo signals from an elastic spherical shell that are evoked in an unbounded ideal compressible fluid by the action of a sinusoidal sounding pulse of finite length. By mathematical simulation of the process of formation of the echo signal it is established that for a given material of the shell, depending upon the thickness of the shell and its radius a frequency range of the sounding pulse can be evolved, at which the elastic deformation of the shell exerts a substantial influence upon the structure and amplitude of the echo signal, as well as frequency ranges at which the echo signal from an elastic shell differs little from the echo signal from an absolutely rigid sphere of the same radius. It is shown that by selecting the frequency of the sinusoidal sounding pulse from the range of strong influence of the elastic deformation of a shell upon the echo signal, it is possible to determine on the basis of the echo signal not only the distance to the shell and its radius, but also the thickness of the shell.
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USSR

METSAVEER, Ya. A. and NIGUL, U. K., Mekhanika Tverdogo Tela, No 6, Nov-Dec 72, pp 60-66

A procedure for conducting such a calculation is presented. Diagrams are presented for an aluminum shell. 5 figures. 6 references.

2/2

USSR

VEKSLER, N. D., NIGUL, U. K., PUKK, R. A., Tallin

"On an Algorithm for Fourier Series Calculation of Echo Signals From Elastic Spherical Objects in an Ideal Fluid"

Moscow, Mekhanika Tverdogo Tela, No 6, Nov/Dec 70, pp 71-83

Abstract: An algorithm based on expansion in a Fourier series is proposed for calculating echo signals from elastic spherical objects. Spherical objects of five types are considered: 1) a hollow elastic sphere with a filler, 2) an empty hollow elastic sphere, 3) a solid elastic sphere, 4) a spherical cavity filled with some other fluid, and 5) an absolutely rigid sphere (the last two are treated as limiting cases). The solid and hollow spheres are described by equations from the linear theory of elasticity, and the medium and filler are treated as ideal compressible liquids. It is assumed that a source located in the medium emits a centrally symmetric pulse. The basis for the mathematical model is the algorithm proposed by R. Hickling and

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USSR

VEKSLER, N. D., et al, Mekhanika Tverdogo Tela, No 6, Nov/Dec 70, pp 71-83

developed in articles published in the Journal of the Acoustic Society of America between 1962 and 1968 (from Vol 34, No 10 to Vol 44, No 3). This algorithm starts with construction of a stationary echo signal produced by an infinite sinusoidal transmission which is then treated as a spectral characteristic function and used in the case of a finite sinusoidal transmission for constructing the solution of the pulse problem by means of a Fourier integral. Modifications of this algorithm are proposed which improve the precision and efficiency of calculations aimed at finding governing principles which will make it possible to identify objects from echo signals.

USSR

UDC 539.3+534.231.1

NIGUL, U. K., ENGEL'BREKHT, Yu. K.

"Nonlinear and Linear Transient Wave Processes in the Deformation of Thermoelastic and Elastic Bodies"

Nelineynyye i lineynyye perekhodnyye volnovyye protsessy deformatsii termouprugikh i uprugikn tel (cf. English above), Institute of Cybernetics, Academy of Sciences Estonian SSR, Tallin, 1972, 76 pp, ill., 82 k. (from RZh-Mekhanika, No 3, Mar 73, Abstract No 3V104 K)

Translation: The monograph discusses linear and nonlinear wave processes in solids considering temperature effects. It consists of three chapters and 14 sections. The first chapter constructs a mathematical model of the nonlinear theory of thermoelasticity considering geometric and physical nonlinearity. Familiar versions of linear and nonlinear equations of heat conductivity are derived from the closed nonlinear system of equations obtained describing the behavior of a thermoelastic medium as a result of certain simplifications. The second chapter presents a classification of methods for analyzing transient processes excited by pulse effects. Particularly discussed is the method of characteristics for solving one-dimensional and two-dimensional

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USSR

NIGUL, U. K., ENGEL'BREKHT, Yu. K., Nelineynyye i lineynyye perekhodnyye volnovyye protsessy deformatsii termouprugikh i uprugikh tel, Institute of Cybernetics, Academy of Sciences Estonian SSR, Tallin, 1972, 76 pp, ill., 82 k.

problems, the grid method and other methods. The third chapter analyzes nonlinear and thermoeffects in the simplest problems of one-dimensional transient wave processes and particular attention is given to problems of the rise of shock waves and a shock profile. I. G. Filippov.

2/2

USSR

KUTSER, M. E., and NIGUL, U. K.

"Front Discontinuities Induced by Pressure Wave in Shells"

Tr. VII Vses. kinferentsii po teorii obolochek i plastinok (Proceedings of Seventh All-Union Conference on Shell and Plate Theory), 1969, Moscow, "Nauka," 1970, pp 340-345 (from RZh-Mekhanika, No 1, Jan 71, Abstract No 1V232 by I. T. Selezov)

Translation: The article considers axisymmetric wave processes in rotational shells of constant thickness on the basis of equations of the Timoshenko type. Aload is assumed in the form of a pressure wave with a diminishing rate of propagation, but initially its velocity exceeds at least one of the characteristic velocities of the hyperbolic system of equations under consideration. On the Basis of simplified equations the authors construct asymototic solutions according to Laplacian representations, with great values of the transformation parameter in the vicinity of cross sections which determine saddle points. These solutions are valid in the vicinity of greatest discontinuities; at a distance from these discontinuities it is recommended that solutions be found numerically by the finite difference method. As an example, the authors consider a circular cylindrical shell subjected to the action of a spherical wave with a center on the axis.

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1/2 014 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--EXPERIMENTAL DETERMINATION OF CERTAIN AUTOMOBILE PARAMETERS ON A TILTING STAND -U-

AUTHOR-(03)-AKSENOV, P.V., NIKANDROV, V.S., SERGEYEV, V.N.

COUNTRY OF INFO--USSR

SOURCE--MOSCOW, AVTOMOBIL'NAYA PROMYSHLENNOST', NO 2, 1970, PP 29-31

DATE PUBLISHED--------70

SUBJECT AREAS--MECH., IND., CIVIL AND MARINE ENGR, METHODS AND EQUIPMENT

TOPIC TAGS--AUTOMOBILE, PARAMETER, TEST STAND

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1999/1217 STEP NO--UR/0113/70/000/002/0029/0031

CIRC ACCESSION NO--AP0123181

UNCLASSIFIED

2/2 014 UNCLASSIFIED PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0123181

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE PROCEDURE AND RESULTS ARE GIVEN FOR DETERMINING CERTAIN AUTOMOBILE PARAMETERS: ANGLE OF TRANSVERSE STATIC STABILITY, UPPER COORDINATE OF THE CENTER OF GRAVITY, ANGULAR RIGIDITY OF THE CARRYING SYSTEM (FRAME), AND SUSPENSION. THIS WAS DONE USING A SPECIAL TILTING STAND.

UNCLASSIFIED

1/2 014 UNCLASSIFIED PROCESSING DATE--02OCT70

TITLE--FIRST STEPS IN THEE METEOROLOGICAL AFFAIRS OF THE USSR -U-

AUTHOR--NIKANDROV, V.YA

COUNTRY OF INFO--USSR

SOURCE--METEOROLOGIYA I GIDROLOGIYA, 1970, NR 4, PP 10-19

DATE PUBLISHED--------70

SUBJECT AREAS--ATMOSPHERIC SCIENCES

TOPIC TAGS--METEOROLOGIC RESEARCH FACILITY, METEOROLOGY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1987/1025 STEP NO--UR/0050/70/000/004/0010/0019

CIRC ACCESSION NO--AP0104423

UNCLASSIFIED

2/2 014 UNCLASSIFIED PROCESSING DATE--02OCT79

CIRC ACCESSION NO--AP0104423

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE ARTICLE ELUCIDATES THE HISTORY ON ADOPTION OF DECREES AND DECISIONS ON THE ORGANIZATION OF THE SOVIET METEOROLOGICAL SERVICE BY THE COUNCIL OF PEOPLES COMMISSARS OF THE RSFSR AND THE COUNCIL OF LABOUR AND DEFENCE OF THE REPUBLIC UNDER THE CHAIRMANSHIP OF V. I. LENIN. A BRIEF INFORMATION IS GIVEN ON THE ACTIVITY OF THE MAIN PHYSICAL (GEOPHYSICAL) OBSERVATORY AS A CENTRAL METEOROLOGICAL INSTITUTION OF THE RSFSR IN THE FIRST YEARS OF THE SOVIET STATE EXISTENCE, AND ON THE ROLE OF GOVERNMENTAL DECISIONS IN THIS ACTIVITY.

UNCLASSIFIED

USSR

UDC 621.357:669...8(04)

NIKANDROVA, L. I.

Leningrad, Khimicheskiye Sposoby Polucheniya Metallicheskikh Pokrytiy (Chemical Methods of Obtaining Metallic Coatings), Izd-vo "Mashinostroyeniye," 1971, 104 pp

Translation of Foreword: The widely used electrochemical (electrolytic) method of applying metal coatings in many cases does not provide the required quality of coating (uniformity of the coating on complex-shaped parts, etc.). The chemical method of applying metal coatings does not have these disadvantages. Data on the application of the chemical method have been reported in so many sources that it is difficult to find information of particular interest. An attempt was made by the author to correlate data on the application of metal coatings by chemical methods reported in various domestic publications and works of Soviet authors. Included in this booklet are works carried out with the assistance of the author. Particular attention has been paid to chemical nickel-plating, which is the most widely used method of coating, and to chemical copper-plating, which is the principal process in the metallization of plastics. Numerous

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USSR

NIKANDROVA, L. I., Khimicheskiye Sposoby Polucheniya Metallicheskikh Pokrytiy, Izd-vo "Mashinostroyeniye," 1971, 104 pp.

recommendations have been made for solutions for chemical coatings which do not differ essentially. An attempt was therefore made by the author to recommend a small number of solutions for the chemical application of coatings, chiefly solutions with stabilizing additions, guaranteeing wide use. Also discussed are methods of the analysis of solutions used for chemical coating. Such analysis is necessary for a correct technological processing and the timely correction of solutions.

Translation of Table of Contents:

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USSR

NIKANDROVA, L. I., Khimicheskiye Sposoby Polucheniya Metallicheskikh Pokrytiy, Izd-vo "Mashinostroyeniye," 1971, 104 pp.

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USSR

NIKANDROVA, L. I., Khimicheskiye Sposoby Polucheniya Metallicheskikh Pokrytiy, Izd-vo "Mashinostroyeniye," 1971, 104 pp.

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USSR

NIKANDROVA, L. I., Khimicheskiye Sposoby Polucheniya Metallicheskikh Pokrytiy, Izd-vo "Mashinostroyeniye," 1971, 104 pp.

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USSR

UDC:621.791.052.01:620.192.4:669.15-194

SHRON, R. Z., NIKANOROVA, N. I., KRECHET, L. E., Urals Heat-Engineering Institute, ZEMZIN, V. N. and ZHITNIKOV, N. P., Central Boiler and Turbine Institute

"Influence of Dispersion Hardening on the Tendency of Welded Joints in Chrome-Molybdenum-Vanadium Steels Toward Brittle Rupture at High Temperatures"

Moscow, Svarochnoye Proizvodstvo, No 12, Dec 73, pp 1-3

Abstract: This work studies the influence of dispersion hardening on the ductility and tendency toward brittle rupture at high temperatures of welded joints in steels types 12Kh1MF and 15Kh1M1F. This study showed the influence of dispersion hardening in heated areas on the tendency of these alloys to local brittle ruptures during heat treatment and use in the untempered and low-tempered states. Heat treatment with high tempering increases ductility and the brittle-rupture resistance of these alloys. To prevent brittle rupture, the holding temperature of steam pipes during heat treatment should be at least 720° C.

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Superalloys

USSR UDC 669.14.018.8:620.17:620.186

NIKANDROVA, YE. A., and MASLENKOV, S. B., TsNIIChermet (Central Scientific Research Institute of Ferrous Metallurgy imeni I. P. Bardin)

"The Structure and Properties of Nickel-Base Wear-Resistant Alloys"

Moscow, Metallovedeniye i Termicheskaya Obrabotka Metallov, No 2, 1973, pp 47-51

Abstract: A study was made of the effect of heat treatment on the structure and properties of new N65M20V15 and N55M2DV25 corrosion-resistant alloys reserved for work in 30%-hydrochlorid acid and 70%-sulfuric acid at up to 90°C in the capacity of wear-resistant materials. The hardness and strength of these nonmagnetic alloys is the same as of tool materials, the maximum hardness obtained on N55M20V25 alloy being HRC 53. In hardened condition, N65M20V15 alloy has the structure of δ^{κ}-solid solution with a face-centered cubic lattice and N55M20V25 alloy has the structure of $\alpha + \delta^{\kappa}$-solid solution. The high hardness of these materials after aging is obtained at the expense of falling out of the tetragonal $Ni_4(Mo, W)$-phase and the M_6C carbide. The advantageous effects of the present α-phase on Nb base in the N55M20V25 alloy, in contrast to the N65M20V15 alloy, are indicated. The $Ni_4(Mo, W)$-

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USSR

NIKANDROVA, YE. A., and MASLENKOV, S. B., Metallovedeniye i Termicheskaya Obrabotka Metallov, No 2, 1973, pp 47-51

phase favors a retention of high hardness up to 600°C at short-term and long-term (up to 1000 hrs) tests. Optimum hardness, strength, and plasticity properties resulted on N55M20V25 alloy in the overaged state. Five figures, three tables.

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USSR

UDC 620.178:620.193:669.24'28'27

NIKANDROVA, YE. A. and IVANOV, A. G. (Deceased), Central Scientific Research Institute of Ferrous Metallurgy imeni I. P. Bardin (TsNIICHERMET)

"Hardness and Corrosion Resistance of Nickel Alloys With Molybdenum and Tungsten"

Moscow, Metallovedeniye i termicheskaya obrabotka metallov, No 3, 1972, pp 24-27

Abstract: The present-day requirements on metals include minimum corrosion resistance (maximum losses for corrosion -- 0.2 mm/year) in solutions of hydrochloric and sulfuric acids and a minimum hardness of HRC 45. The objective of this study lies in the area of development of metals designed to meet these requirements. The experimental steels included N55M10V35, N70M15V15, N65M15V20, N55M15V30, N65M20V15, N60M20V20, and N55M20V25 alloys. The hardness and corrosion resistance of the alloys were tested versus various additions of tungsten and as a function of acids and aging temperatures (hold time 1 hr). The newly developed hard and corrosion-resistant Ni-Mo-W alloys (N65M20V15 and N55M20V25) showed maximum losses of 0.2 mm/year in 30% HCl at 60°C and in 70% H_2SO_4 at 90°C and maximum hardness of HRC 52.

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USSR

UDC 548.535

LERINMAN, R. M., MURSAYEVA, G. V., NIKANOROV, N. A., and KHVOSTYNTSEV, K. I., Institute of Physics of Metals, Academy of Sciences USSR

"Influence of Plastic Deformation and Alloying With Slight Amounts of Interstitial Elements on Decomposition of the Metastable β Phase in TC6 Alloy"

Sverdlovsk, Fizika Metallov i Metallovedeniye, Vol 31, No 3, Mar, 71, pp 626-633

Abstract: Electron microscopy and determination of the mechanical properties are used to study TS6 alloy with various contents of interstitial impurities in various initital states. It is demonstrated that after rolling and aging, the alloy reaches its maximum strength properties with briefer aging and considerably smaller dimensions of α phase segregations than after ordinary aging. The density of residual dislocations in the alloy following rolling and aging is still near the density of dislocations in the deformed state with these types of treatment. With low

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USSR

NIKANDROVA, YE. A., et al, Metallovedeniye i termicheskaya obrabotka metallov, No 3, 1972, pp 24-27

The recommendations to facilitate production of age-hardened steels with high hardness values include quenching in water from 1000-1050°C and subsequent aging at 800°C for 4 hrs. (4 illustrations, 2 tables, 6 bibliographic references).

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LERINMAN, R. M., et al., Fizika Metallov i Metallovedeniye, Vol 31, No 3, Mar 71, pp 626-633

degrees of deformation, a high combination of mechanical properties can be achieved only in the case of the initial polygonized state. The influence of an increased content of interstitial impurities with rolling and aging on the kinetics of decomposition of the P phase is significantly weaker than in the case of ordinary aging.

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USSR

UDC: 669.295:620.186.4

NIKANOROV, M. A.

"Inverse Transformation in Titanium Alloys With an Unstable Beta-Phase Under the Effect of Tensile Stresses"

Sverdlovsk, Fizika metallov i metallovedeniye, Vol 32, No 5, Nov 71, pp 1056-1061

Abstract: In continuation of earlier research on phase transformations occurring in titanium alloys with unstable β-structures, this study makes use of metallographic and x-ray diffraction analyses as well as hardness measurements to investigate structural transformations taking place in pre-aged TS6 and VT15 titanium alloys due to applied tensile stresses. The materials involved were ERKh electrolytic chromium, VEL2 electrolytic vanadium, a master alloy of 43% Al - 57% Mo made from AV000 aluminum and TG-100 titanium sponge. The experiment indicates the feasibility of a transformation -- induced by external tensile stresses -- of a high-hardness structure formed under interrupted aging (200+300°C) and consisting of the finest α-phase particles coherently bonded with a β-matrix solid

USSR
NIKANOROV, M. A., Fizika metallov i metallovedeniye, Vol 32, No 5, Nov 71, pp 1056-1061

solution to a low-hardness structure of the initial β-phase (recovery phenomenon). The intensity of the process of inverse transformation is determined by the magnitude of external stresses applied to the material and the amount of the α-phase which, in turn, depends on the hardening temperatures of the β-alloys. (5 illustrations, 1 table, 1 bibliographic reference)

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USSR

UDC 669.295:620.193.91:548.4

LERINMAN, R.M., MURZAYEVA, G.V., NIKANOROV, M.A., and KHVOSTYINTSEV, K.I.,
Institute of Metal Physics, Academy of Sciences USSR

"Effect of Initial Dislocation Structure and Interstitial Impurity Content on the Microstructure and Properties of Beta-Titanium Alloy TS6 After Aging"

Sverdlovsk, Fizika Metallov i Metallovedeniye, Vol 31, No 2, Feb 71, pp 352-357

Abstract: This article is a continuation of works devoted to a study of changes in structure and mechanical properties of TS6 beta-titanium alloy after aging in relation to initial structure and interstitial impurities content. Sheet samples of TS6 alloy of two heats with a differing impurities content were studied. One heat (971) was melted in VEL-3 electrolytic vanadium the other (603) -- in aluminothermic vanadium by electron-beam remelting. Heat 603, in contrast to heat 971, contained 1% Zr. The fine structure and mechanical properties were investigated after heat treating by the following modes: a) quench from 850°C, deformed 40% by rolling and given repeated quenchings from 700, 800, and 900°C (hardened state); b) aging of samples quenched from the above-stated temperatures. Aging was accomplished at 480°C for 2, 10, and 30 hours. In the initial polygonized state particles of the liberated phase, upon aging, were highly dispersed and distributed uniformly, which is the result of alpha-phase particle nucleation into dislocations. In the initial

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LERINMAN, R.M., et al, Sverdlovsk, Fizika Metallov i Metallovedeniye, Vol 31, No 2, Feb 71, pp 352-357

recrystallized state for pure melting, the low mechanical properties are dependent on the vast nonuniformity of beta-phase decomposition which leads to the formation of local stresses near the particles at the time of deformation. The measured content of interstitial impurities facilitates obtaining a uniform and more dispersed structure after aging and decreases bordering layers made up of the un-decomposed beta-phase. The best properties of alloy TS6 can be obtained in combination with the initial polygonized state and an optimum content of impurities of interstitial atoms (Tensile Strength = 140 kg/mm^2, reduction in area = 6%). 3 figures, 1 table, 9 bibliographical references.

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USSR

UDC 669.295:620.193.91

NIKANOROV, M. A., and LATSH, V. V.

"Aging Titanium Alloys With an Unstable Beta-Structure"

Sverdlovsk, Fizika Metallov i Metallovedeniye, Vol 31, No 2, Feb 71, pp 342-351

Abstract: A study was made of the effect of heat treatment and varying oxygen content on the kinetics and nature of beta-phase decomposition in thermally unstable beta-titanium alloys. Titanium alloys TC6 (TiAl3Mo4V6Cr11) with two levels of oxygen content and VT15 (TiAl3Mo8Cr11) with a low oxygen content were studied. Ingots weighing 100 kg were melted in a electric-arc vacuum furnace by the method of double melting with a consumable electrode. Blanks with a 100-mm diameter were forged from ingots 280 mm in diameter and then forged into rods with a 20-mm diameter. The rods were turned to a diameter of 15 mm and cut into samples 20-mm long. Results of the study showed that when alloy TS6 (0.065% O_2) is aged at 200°C there occurs a formation of the omega-phase which is accompanied by an increase in alloy hardness. An increase in quench temperature significantly accelerates the process associated with omega-phase formation. With increased oxygen content the process of omega-phase formation is slowed. After aging at 300°C for 1000 hours no precipitation of the omega-phase is observed by x-ray analysis, which indicates a lowering of intensity or complete conversion of omega-phase formation. In alloys VT15 and TS6 with a low oxygen content (0.065%), low-temperature aging in combination with subsequent aging at 300°C leads to an intense growth in hardness which

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NIKANOROV, M. A., et al, Sverdlovsk, Fizika Metallov i Metallovedeniye, Vol 31, No 2, Feb 71, pp 342-351

was manifested by formation of a structure consisting of fine particles of the alpha-phase, coherently bonded with the matrix beta-phase solid solution. The structural state forming as a result of step aging differed from the structural state observed after ordinary modes of aging at 200 and 300°C. Treatment of the alloys with this structure according to the mode of 580°C for three minutes leads to formation of a structure with the initial beta-phase. The omega-phase forming as a result of low-temperature aging initiates formation of the alpha-phase in the process of extended aging at 450°C. One can assume that for a given treatment, formation of the alpha-phase in the studied alloys proceeds directly from the omega-phase. The authors thank R.M. LERINMAN and G.V.MURZAYEVA for examining a number of TS6 samples under an electron microscope and calculating their electron-diffraction structures. 7 figures, 3 tables, 13 bibliographical references.

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USSR UDC 548.535

LERINMAN, R. M., MURSAYEVA, G. V., NIKANOROV, M. A., and KHVOSTYNTSEV, K. I., Institute of Physics of Metals, Academy of Sciences USSR

"Influence of Plastic Deformation and Alloying With Slight Amounts of Interstitial Elements on Decomposition of the Metastable β Phase in TC6 Alloy"

Sverdlovsk, Fizika Metallov i Metallovedeniye, Vol 31, No 3, Mar, 71, pp 626-633

Abstract: Electron microscopy and determination of the mechanical properties are used to study TS6 alloy with various contents of interstitial impurities in various initital states. It is demonstrated that after rolling and aging, the alloy reaches its maximum strength properties with briefer aging and considerably smaller dimensions of α phase segregations than after ordinary aging. The density of residual dislocations in the alloy following rolling and aging is still near the density of dislocations in the deformed state with these types of treatment. With low

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LERINMAN, R. M., et al., Fizika Metallov i Metallovedeniye, Vol 31, No 3, Mar 71, pp 626-633

degrees of deformation, a high combination of mechanical properties can be achieved only in the case of the initial polygonized state. The influence of an increased content of interstitial impurities with rolling and aging on the kinetics of decomposition of the β phase is significantly weaker than in the case of ordinary aging.

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USSR

UDC 538.56:530.145

MUSTEL', YE.R., NIKANOROV, S.I., PARYGIN, V.N., FRIDMAN, G.KH.

"Spatial Electron Beam Light Modulator"

Kvantovaya elektronika (Quantum Electronics), Moscow, No 6(12),1972,pp 113-115

Abstract: The technical and physical principles of operation of a spatial electron-beam light modulator with a cooled KDP crystal are described. The device contains a light source, a polarizer, an analyzer, a dividing prism-cube, a copper cold conductor, and a crystal with a silver-plated rear surface which serves as an electrode (signal plate). The crystal is cooled by liquid nitrogen to a temperature close to the point of phase transition (T_k = -151° C). A comparative analysis is made of possible regimes of information inscription. The possibility is shown of rejecting employment of a system of precise temperature stabilization in a regime of nonequilibrium inscription. The resolution and the image contrast produced by the modulator are studied, and methods of optimizing the device are shown. A number of possible applications of the device are described. 3 fig. 3 ref. Received, 10 May 1972.

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USSR

MURASHOV, L. S., NIKANOROV, S. I., PARYGIN, V. N.

"Cathode-Ray Tube with an Electro-Optical Screen"

Checkhov, Tekhnika Kino i Televideniya, No 10, 1972, p 54

Abstract: A study was made to determine the possibility of using a cathode ray tube with an electrooptical screen in television equipment. The tube design was similar to that described previously [T. A. Kuliyev, et al., Vestnik Moskovskogo Universiteta, No 5, 1971]. In the investigated model, the electro-optical plate was cooled to temperatures close to the phase transition points of the electro-optical potassium dihydrophosphate crystal KH_2PO_4 (T_b = -150°C). Both the equilibrium and nonequilibrium methods of recording the relief potential on the electro-optical crystal were used. The resolution of the device was basically defined by the size of the electron beam if the following condition was satisfied:

$$2r_m \geq \min\left(d, \ell\sqrt{\varepsilon_\perp/\varepsilon_\parallel}\right),$$

where r_m is the radius of the electron beam cross section; d is the distance from the crystal to the collector; ℓ is the thickness of the crystal; $\varepsilon_\perp$ and $\varepsilon_\parallel$ are the dielectric constants of the electro-optical crystal orthogonally and along the optical axis respectively. The simplest method of increasing the

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USSR

MURASHOV, L. S., et al., Tekhnika Kino i Televideniya, No 10, 1972, p 54

resolution of the cathode ray tube with an electro-optical screen was bringing the collector closer to the crystal with simultaneous constriction of the electron beam. It is theoretically possible to obtain a complete television image with a contrast of more than 50:1 on a crystal 60 × 60 × 1 mm^3 (d = 0.05 mm, $2r_m$ = 0.04 mm). A contrast of 110:1 was obtained experimentally when recording a single line. This resolution makes it possible to use the device not only in systems with ordinary image representations also in holographic television. The primary deficiency of the device, nitrogen cooling, can be eliminated by using such electro-optical crystals as KD_2PO_4 [Ye. R. Mustel', et al., Metody modulyatsii i skanirovaniya sveta, Nauka, 1970]. Use of such crystals offers the possibility of using a semiconductor cooling device or if the information is not to be stored for a long period of time, operation at room temperature. A light beam of almost any power can be used to display the image on the electro-optical plate, and therefore the device can be used in projection television systems, including large-screen systems and in a number of other areas of television engineering.

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UDC: 51:330.115

USSR

NIKANOROV, S. P.

"Model of a Technical System"

Sb. tr. in-t gidrodinam. Sib. otd. AN SSSR (Collected Works of the Institute of Hydrodynamics, Siberian Department, Academy of Sciences, USSR), 1970, vyp. 3, pp 129-260 (from RZh-Kibernetika, No 9, Sep 71, Abstract No 9V524)

Translation: General comments and a set of formal definitions

1/1

NIKANOROV, Ye. A.

TECHNICAL TRANSLATION

FSTC-HT-23- 1281-71

ENGLISH TITLE: PRODUCTION TESTING OF THE DNK-02 LIGHT DISTANCE MEASURING DEVICE

FOREIGN TITLE: PROIZVODSTVENNOYE ISPYTANIYE SVETODAL'NOMERNOY NASADKI DNK-02

AUTHOR: L. I. Pikand and Ye. A. Nikanorov

SOURCE: GEODEZIYA I KARTOGRAFIYA, No. 6, 1970, pp. 17-20

Translated for FSTC by Leo Kanner Associates, Redwood City, California

NOTICE

USSR

UDC 616.001.4-08

SHCHUR, V. V., MAKEYEVA, N. S., ARENBERG, A. A., GOL'TS, M. V., and NIKANOROV, YU. A., Fryazino Central Municipal Hospital

"Use of a Laser to Treat Wounds"

Leningrad, Vestnik Khirurgii imeni I. I. Grekova, No 6, 1972, pp 85-89

Abstract: A helium-neon laser (output power 10 milliwatts, wavelength 6328 Å) was used to treat 25 patients with persistent non-healing wounds and trophic ulcers of the lower extremities that had previously shown no response to conservative treatment, physical therapy, or surgery. The course of treatment included 12 to 25 daily sessions with the initial exposure of 20 to 30 seconds gradually increased to several minutes. The results showed complete healing of the wounds with the formation of a rather elastic connective-tissue scar and epithelization in 19 and marked contraction of the wound area in 4. In the great majority of patients, active growth of granulations in the wound and start of epithelization at the margins were evident after 3 to 5 sessions. Neither the microflora of the wound nor the main hematological indexes (except a slight decrease in the WBC after 70 to 10 procedures and near normalization by the end of treatment) were significantly affected by the laser radiation. Follow-up of 16 patients for 3 to 7 months revealed no recurrences of the wounds.

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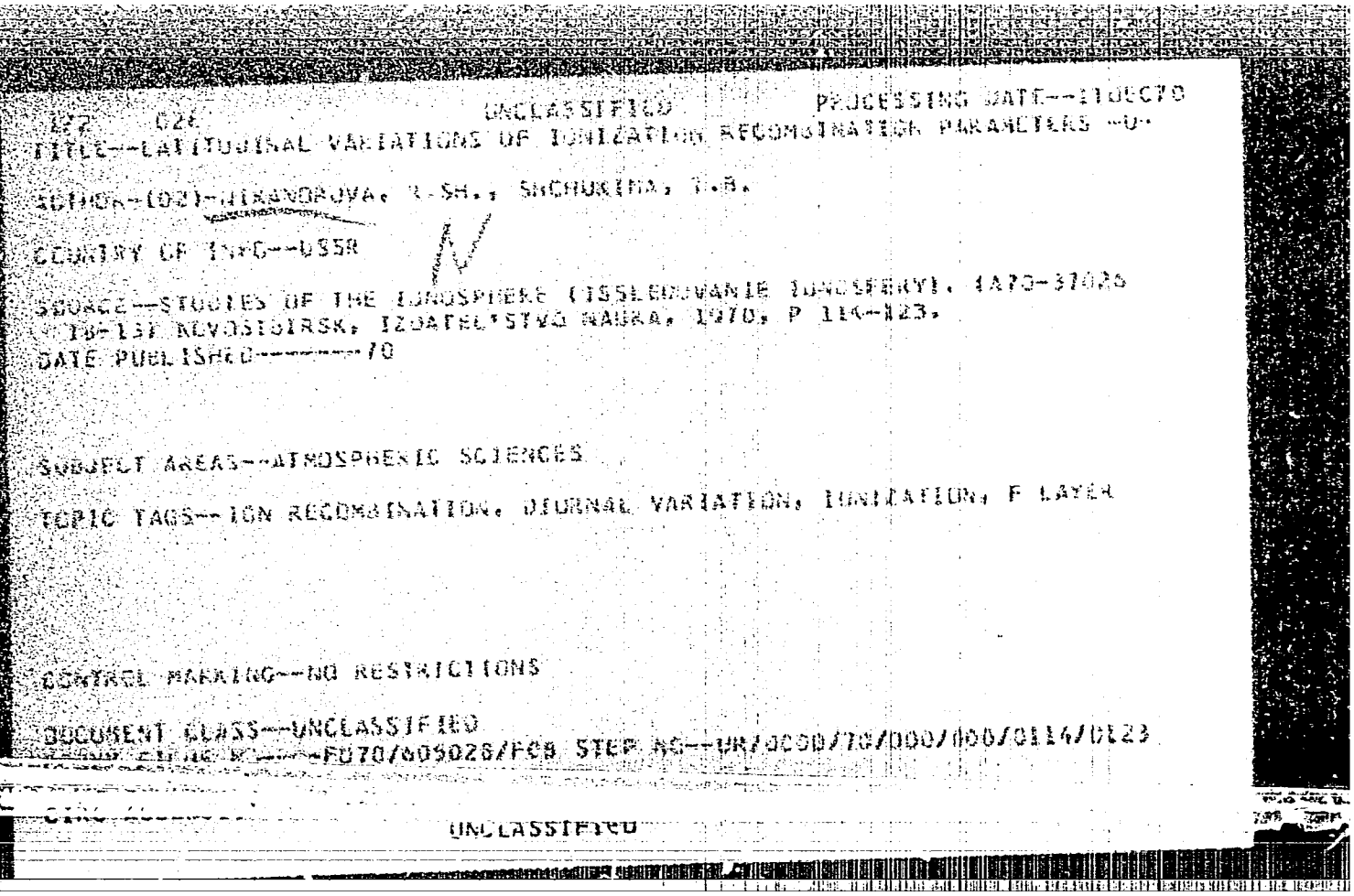

UNCLASSIFIED PROCESSING DATE--11DEC70

TITLE--LATITUDINAL VARIATIONS OF IONIZATION RECOMBINATION PARAMETERS -U-

AUTHOR-(02)-ALEXANDROVA, T.SH., SHCHUKINA, T.B.

COUNTRY OF INFO--USSR

SOURCE--STUDIES OF THE IONOSPHERE (ISSLEDOVANIE IONOSFERY), 1970-37026 (TR-151 NOVOSIBIRSK, IZDATEL'STVO NAUKA, 1970, P 114-123.

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SUBJECT AREAS--ATMOSPHERIC SCIENCES

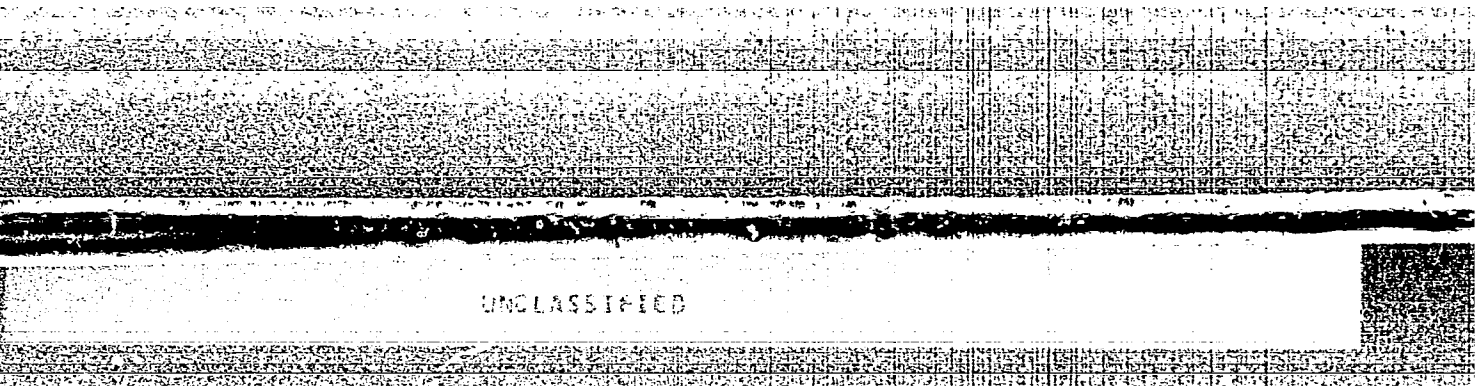
TOPIC TAGS--ION RECOMBINATION, DIURNAL VARIATION, IONIZATION, F LAYER

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

CONTROL NO.----FD70/005026/FCB STEP NO--UR/0000/70/000/000/0114/0123

UNCLASSIFIED



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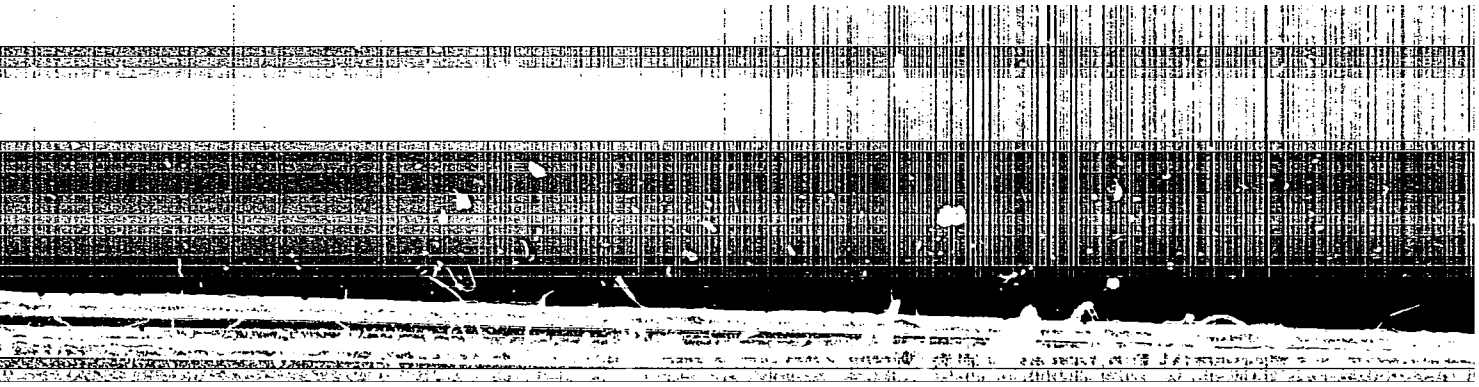

APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002202220001-0"

USSR

UDC: 51:330.115

NIKANOROV, S. P.

"Model of a Technical System"

Sb. tr. in-t gidrodinam. Sib. otd. AN SSSR (Collected Works of the Institute of Hydrodynamics, Siberian Department, Academy of Sciences, USSR), 1970, vyp. 3, pp 129-260 (from RZh-Kibernetika, No 9, Sep 71, Abstract No 9V524)

Translation: General comments and a set of formal definitions

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NIKANOROV, Ye. A.

TECHNICAL TRANSLATION

FSTC-HT-23- 1281-71

ENGLISH TITLE: PRODUCTION TESTING OF THE DNK-02 LIGHT DISTANCE MEASURING DEVICE

FOREIGN TITLE: PROIZVODSTVENNOYE ISPYTANIYE SVETODAL'NOMERNOY NASADKI DNK-02

AUTHOR: L. I. Pikand and Ye. A. Nikanorov

SOURCE: GEODEZIYA I KARTOGRAFIYA, No. 6, 1970, pp. 17-20

Translated for FSTC by Leo Kanner Associates, Redwood City, California

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UDC 616.001.4-08

USSR

SHCHUR, V. V., MAKEYEVA, N. S., ARENBERG, A. A., GOL'TS, M. V., and NIKANOROV, YU. A., Fryazino Central Municipal Hospital

"Use of a Laser to Treat Wounds"

Leningrad, Vestnik Khirurgii imeni I. I. Grekova, No 6, 1972, pp 85-89

Abstract: A helium-neon laser (output power 10 milliwatts, wavelength 6328 Å) was used to treat 25 patients with persistent non-healing wounds and trophic ulcers of the lower extremities that had previously shown no response to conservative treatment, physical therapy, or surgery. The course of treatment included 12 to 25 daily sessions with the initial exposure of 20 to 30 seconds gradually increased to several minutes. The results showed complete healing of the wounds with the formation of a rather elastic connective-tissue scar and epithelization in 19 and marked contraction of the wound area in 4. In the great majority of patients, active growth of granulations in the wound and start of epithelization at the margins were evident after 3 to 5 sessions. Neither the microflora of the wound nor the main hematological indexes (except a slight decrease in the WBC after 70 to 10 procedures and near normalization by the end of treatment) were significantly affected by the laser radiation. Follow-up of 16 patients for 3 to 7 months revealed no recurrences of the wounds.

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